

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

## GUJARAT TECHNOLOGICAL UNIVERSITY

BA - SEMESTER-III EXAMINATION – WINTER 2018

Subject Code:1035003

Date:01/12/2018

Subject Name:Structure-III

Time:10:30 AM TO 12:30 PM

Total Marks: 50

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a) Explain buckling of a column and write down the “Euler Crippling Load” formula for different end conditions of the long column. 06
- (b) Define Axial Load and Eccentric Load also state equation of Direct and Bending Stress. 04
- Q.2 (a) Advantages and disadvantages of indeterminate Structures 04
- (b) Define the following terms : 06  
Long column, Strut, Resilience, Strain, Direct stress, Buckling load.
- OR
- (b) Calculate the radius of gyration of the hollow rectangular Section which has outside dimension 300 mm width & 650 mm depth & inside dimension 250 mm width & 550 mm depth. 06
- Q.3 A two span continuous beam ABC is simply supported at A, B and C such that AB= 4m and BC = 6m. The span AB carries a u.d.l. of 25 kN/m and span BC carries a central point load of 120 kN. Draw S.F and B.M diagrams for the beam. 10
- OR
- Q.3 A fixed beam of 10 m span carries a point load 50 kN @ centre, and 15 kN/m udl all over the span. Draw Shear Force Diagram & Bending Moment Diagram for the beam. 10
- Q.4 A square column of 550 mm side carries a compressive Load of 800 kN at an eccentricity of 120 mm on x-x axis. Find maximum stress and minimum stress at the base of the column. Draw the Stress Diagram. 10
- OR
- Q.4 Determine the slope & deflection at the free end B of a 3 m long cantilever beam AB, if beam carries a udl of 20 kN/m on entire span. Take beam of 250 x 550 mm and  $E = 2 \times 10^5 \text{ N/mm}^2$ . 10
- Q.5 5 m long column, an 'I' section, has 350 mm depth and 130 mm width. Thickness of flange and web is 1 cm. It is used as a column with one end fixed and other hinged. Determine safe load with Euler's formula keeping factor of safety as 7.05.  $E = 2 \times 10^5 \text{ N/mm}^2$ . 10
- OR
- Q.5 A steel rod 6m long and of 350mm diameter is used as a column, with one end fixed and other free. Determine the crippling load by Euler's Formula. Take E as 200 GPa. 10

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